Talk for ICAO Conference on Environmental Management

Good Morning Ladies & Gentlemen, this morning I would like to explore the question of "Why a systems approach is important in managing an Airports Environmental Aspects?"

This presentation will use a case study developed jointly between my own company, ABC Environs Limited and an established IRCA registered trainer Nigel Bauer & Associates.

To answer this question I shall look at the ISO process for developing an EMS;
Examine how this approach was applied at a fictitious location used in a training course case study;
Summarise aspects that could have been missed by not using the systems approach.

Whilst the ISO14001 standard does not specifically require the site to undertake a baseline review of its environmental aspects, it is a process that is recommended within supporting guidance. I hope that this talk will persuade people that this exercise is invaluable if a site is to identify all the environmental risks facing the airport business.

Once the risks and aspects have been identified, there is a need to prioritise the aspects identified to ensure that management time is not diverted away from the highest risk areas on more minor issues.

Once the risks have been identified, management controls need to be defined.

A programme then needs to be defined to implement the control measures.

The programme needs to be reviewed to ensure the procedures remain relevant, effective and improvements are made to performance.

The case study was born out of a need to create a realistic basis for audit training within the aviation sector. The location could be anywhere in the world.

The environmental aspects and scenarios included in the case study are based on real experiences at various airports in the UK, all of which have given their permission to allow the issues to be used in the development of the training package.

In reality, the process was adopted at the subject airports and it helped to identify unknown risks and aspects that needed to be managed. I will provide examples of these risks later in this talk, but I cannot overstress the importance of the role played by the ISO process in identifying the aspects.

The case study covers the EMS development process as prescribed by ISO14001. The first two days provide an introduction to the airport site and the EMS process through the use of exercises. These exercises cover aspect identification; assessing the significance of these aspects and the establishment of risk registers.

During the third and fourth days, the delegates are expected to undertake a "virtual" audit of the location. The course concludes with a closeout exercise on the morning of the fifth day, followed by an examination in the afternoon.

So, let us look at the case study airport itself. This location has been built up to reflect a typical airport. There are three primary surface transport links to the airport – two highway links and a main line passenger rail connection. One highway can be seen to the left of this picture and the mainline rail link towards the top. There is another highway just out of picture shot above the scene seen here.

An examination of hydro-geological data shows that the airport is situated on loose gravels that hold high quality groundwater. The groundwater flows quite rapidly from the top right corner of the shot down to the bottom left. At the bottom of the shot we can see an area of countryside, into which the groundwater flows, this is a designated country park.

The site concerned interpreted the EMS process to require a more in-depth investigation of the country park and the surrounding river systems. This revealed that water is abstracted from the river system just 600m downstream from the airport boundary. This additional information was invaluable to the management of any discharges to water (both surface and ground) and the management of emergency scenarios. One big risk is that any pollution event reaching the water abstraction point could force this to be shut down with severe litigative consequences. Such an event could result in a criminal prosecution for causing the pollution and a civil prosecution by the water company for loss of earnings and disruption to the business process. One useful point of information gained revealed that the water abstracted from this location was used to supply local conurbations – many of the employees working at the airport live in these conurbations, this was built into awareness training. The training resulted in all staff taking extra care over the handling of chemicals and management of emergency scenarios.

Finally, the research in to the surrounding area shows there are a number of industrial sites within a short distance of the airport, some of these discharge effluent into the groundwater upstream of the site. For this reason, the site involved elected to drill a number of boreholes to monitor the quality of the groundwater flowing across the site. This allows the management team to measure the effect of airport operations on the groundwater.

Now lets look at the main apron area. The apron has been designed with protection of the groundwater resource in mind. All of the apron drainage is discharged to the groundwater. All drains are fitted with penstock interceptors, which can be remotely shut from the fire station watch room. Given the sensitivities of the groundwater, any spillage is required to be reported to the watch room where a member of the emergency team will assess the danger and if required close the penstock and flush the spillage to the interceptor, which remains closed until specialist contractors can remove the substance. This process was directly driven by the findings of the initial review mentioned earlier.

However, the local planning authority did not consider the aspects when considering planning approval. The fuel farm, which can be seen here on the right hand side of this picture, stores fuel in underground tanks. These obviously pose an increased risk to the airport, as any leak from the tanks is harder to detect than if it occurred from above ground tanks. However, the local planning authority insisted that the tanks be placed underground, the airport, therefore had to install sophisticated leak detection equipment to ensure that the groundwaters are protected.

Finally, the airport was in possession of a consultant's report clearly stated that ALL surface water drained through soakaways to the groundwater. This confirmed the need to protect the ground water. There was also a prohibition issued by the local Environmental Protection Agency on the use of glycol and urea based de-icing chemicals on the runway or taxiway systems.

During the site investigation, the airport decided to look for springs emanating from the groundwater, local maps had shown evidence for a "spring line" close to the river system. During the site investigation, operatives decided to walk the airport boundary; they found two of these structures. They are clearly drainage outfalls, but where do they originate?

The airport had no drainage maps showing the surface drains, but they did appear on national large scale maps. Further exploration confirmed that these outfalls carried surface waters from the runway directly to the river – this now poses more significant risks that the airport needs to manage. This proves the adage that your cannot always believe what consultants write. Procedures and monitoring regimes have now been amended to include these drainage runs.

Following the discovery of the surface water drains, the area of country park adjacent to the airport boundary was investigated. It was discovered that this is in fact an area of special scientific interest and has been designated as being of national importance. The groundwater flowing under the airport is in continuity with the sensitive river system that supports the country park. The airport drainage is therefore intrinsically linked to the ecology of the country park and requires a close liaison with the country park management team.

The case study airport had given instructions that all chemical storage tanks should be protected and procedures established to manage the chemical stores. Most airports would ensure that the protection measures are put in place, but how many airports would undertake inspections of tenants and contractors to ensure that these facilities are being managed correctly? Here we see a fuel storage tank with a required burm or bund, but there is clear evidence that the management procedures are not effective. The refuelling gun should be held within the bunded (burmed) area, but it is being hung from the external ladder. We can clearly see evidence of spillage on the outside wall of the bund, the ground adjacent to the bund wall has been made up, but the question remains, has the contamination been cleared or just covered?

A structured methodology of inspection of contractor and tenant areas is required to ensure that their actions do not compromise the overall environmental performance of the site. Consider this – this compound is a temporary arrangement, the continual spillage of fuel indicated by the staining on this bund wall could be building up problems for the future occupation of this site. In the context of the case study location, any oil spilled on the surface could enter the groundwater and ultimately find its way to the country park and perhaps even contaminate the water abstraction point.

Finally, a review of the habitat and site ecology has revealed the existence on the site of species protected by law. This restricts the ability of the airport to undertake development work and landscaping on the site. It is illegal in the fictitious region of the airport locality to interfere with the habitat of these protected species and any landscaping must enhance the quality of life for these animals or they should be left alone, unless their presence causes a safety risk to aircraft.

The presence of these species is also interlinked with the ecology of the country park, as they tend to use this area as a feeding ground, returning to the airport land where they have built their home. There is, therefore a need to ensure that procedures are developed that ensures all projects planed for the area where these animals live take account of their presence and minimises any disruption.

So, How did ISO14001 help with the management of the site?

- It prompted the site management to re-examine the evidence they held and survey the site for all interactions with their external environment;
- The survey proved that their assumptions regarding the aspects of the site were incorrect and other "hidden" aspects were found – this is not uncommon;
- It also proved that some of the data contained in consultants reports were wrong;
- The results of the survey also forced a rethink on how the procedures should be written and the risks that needed to be managed; (slide 13)
- It allowed the management team to focus their attention on priority areas. Many airports starting to develop their own EMS attempt to tackle all subjects with the same level of importance, but this can place a

disproportionate amount of work onto the line management teams. It is better to allocate a level of significance or priority to each aspect and target the most important ones. In the case study airport, it would be easy for the airport to focus on subjects such as surface transport or air quality, but when looking at the aspects, there are higher priorities in water quality and ecological management;

- Buy using site personnel to undertake the site tours and boundary walks, it facilitated the "buy-in" from staff for the EMS;
- The information regarding some risks such as the potable water abstraction point allowed the staff to construct training courses that focused on the local risks. This provided a local flavour to environmental awareness training that made the subject far more relevant than if a more generalised talk had been given. In the real site concerned with this issue actually discovered that the level of environmental awareness improved greatly after the training had been given and the most common aspect remembered from the courses was the position of the abstraction point and the need to prevent spillage.

So, in conclusion, we can say that the development of an EMS does need to be undertaken within a designated framework and that this framework needs to be robust enough to encourage the site to challenge preconceived ideas regarding aspects.

The reviews required to establish the aspects will probably produce unexpected and unknown risks that will need to be managed. This makes it even more important that the risks are prioritised in some manner. The evaluation of significance can help with this process and save managers diverting attention away from more important risks to minor issues that could wait for another time

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